

US EPA ARCHIVE DOCUMENT

## SECTION IV.

### Successes and Accomplishments

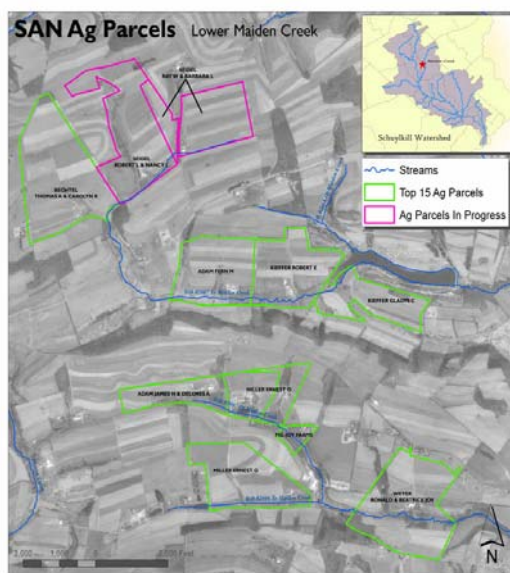
#### Schuylkill Action Network Strives to restore Agriculturally-impaired streams

Small livestock farms in headwater streams often lack stream bank fencing, riparian buffers, and contribute fecal coliform bacteria from livestock in the Schuylkill River watershed in southeastern Pa. Agricultural nonpoint source problems are initially being targeted to the lower Maiden Creek watershed in Berks County. The Philadelphia Water Department (PWD) is conducting water quality monitoring which will show improvements in this Schuylkill Action Network (SAN) restoration initiative. The restoration sites are on small un-named tributary streams to the Maiden Creek, which is listed as impaired due to agriculture, crop-related agriculture, and grazing-related agriculture sources; Causes of impairment are sediment and nutrients. These Sources/Causes impair approximately 18.6 miles of stream, representing almost 100 % of documented nonpoint source problems.

#### Problem

Bacteria, nutrients, and sediment from agricultural sources are a major problem in much of the Maiden Creek watershed in Berks County, southeastern Pa. Parts of the basin are impaired on Pa's 2004 Integrated List of All Waters due to agricultural sources of impairment. Specific project locations were identified and prioritized to correct nutrient, bacteria, and sediment problems, as shown in Figure 2. Source-water protection is important. The Maiden Creek is an important drinking water supply for the City of Reading, which draws its water from Lake Ontelaunee. Both source-water protection and Section 319 watershed assessment studies have documented these agriculture NPS problems. The Pa. DEP Statewide Surface Water Assessment Program (SSWAP) conducted stream monitoring to determine Source/Cause of impairments in 2001 and the stream was listed as impaired in 2002.

Figure 2 SAN project locations



(Source: Philadelphia Water Dept.)

### Project Highlights

The SAN-Agriculture workgroup, formed in October 2003, determined top priority sites in the Schuylkill River watershed for installation of best management practices (BMPs) such as stream bank fencing, livestock crossings, and riparian buffer plantings. Conservation planning is also a priority. Table 12 summarizes BMPs implemented to date. Using the PWD ranking system EVAMIX, a matrix-based decision support technology, and the expertise of workgroup members, several clusters of farms, approximately 50 total, were selected and then prioritized. Follow-up visual assessments were performed on all priority sites that had been determined by first using electronic tools. The number of priority sites was reduced from 30 to 15 farms on approximately five stream miles in the watershed. Livestock exclusion BMPs provided the highest return on investment; this was one criteria used.

The Berks County Conservation District, Berks County Conservancy, farmers, and other partners play integral roles in this restoration effort. The goal is to work in headwaters streams in the Maiden Creek watershed and progress downstream. The lower Maiden Creek is the current area of focus; the upper Maiden Creek is the next area. The Irish Creek, tributary to the Schuylkill River, will follow. Project implementation at these priority sites began in Fall 2005 with work on four farms completed. Projects on up to eight more farms are proposed for 2006 and overall project completion is anticipated in 2007.

Table 12. BMPs implemented in lower Maiden Creek

Practice	Amount/Acres Treated
Stream bank fencing	14,600 linear feet
Riparian buffers	Approx. 5 acres
Livestock crossings	7
Livestock watering access	3
Riparian planting	Spring 2006
Conservation Planning	Ongoing

### Results

The SAN-Agriculture workgroup has initially received cooperation from landowners representing approximately one stream mile of an unnamed tributary to the lower Maiden Creek. Figure 2 shows locations of initial implementation phase projects. The PWD is monitoring water quality at project sites. Table 13 provides initial water quality monitoring data. Benthic and chemical baseline monitoring was completed for the first project sites in the Fall 2005. The PWD developed a protocol as part of the SAN grant. Comprehensive water quality monitoring may help justify removal of impaired segments from Pa's Integrated List of All Waters-Impaired streams requiring a TMDL. Projects are to be completed on five stream miles by 2008. An approximate 30% reduction in pollutant loadings from priority sites is a goal. Water quality monitoring for nitrogen, phosphorus, and sediment may show changes from baseline conditions. No load reduction data is available at this time.

### Partners and Funding

The initiative would not be successful without the PWD; Berks and Lehigh County Conservation Districts; Berks County Conservancy; Penn State Extension-Berks; Farmers; Aqua Pennsylvania; Environmental Protection Agency; and Pa Dept. of Environmental Protection working together.

The Partnership for the Delaware Estuary/PWD was awarded a \$1.15 million Targeted Watershed Initiative Grant in February 2005. Approximately \$310,000 of the total amount is being used for BMPs and conservation planning at priority locations identified by the SAN-Agriculture workgroup. Approximately \$10,000 in In-kind services are being provided by the SAN-Ag workgroup partners. Since 1998, approximately \$150,000 in Section 319 funds have been used in Berks and Lehigh Counties to address agricultural NPS problems in the Maiden Creek watershed.

### Photographs

Figure 3. SAN projects in Berks County

(2 Colored pictures)

Livestock crossing and stream bank fencing on an UNT to the Lower Maiden Creek

### Water Quality Data

Table 13. SAN Water Quality Monitoring data at CS project

	<b>EPA Standard</b>	<b>9/05 below</b>	<b>10/05 below</b>	<b>10/05 below</b>	<b>10/05 above</b>
E. coli (per 100 ml)	0	22000	3800	NR	NR
Fecal coliform (per 100 ml)	0	22000	3040	9000	200
Nitrite (mg/L)	0.25	ND	ND	ND	ND
Nitrate (mg/L)	10	1.3	9.7	8.4	6.6
Ammonia (mg/L)	0.10	5.1	0.76	0.24	ND
O. Nitrogen (mg/L)	0.10	24.3	1.56	0.10	0.56
Total Nitrogen (mg/L)	0.10	29.4	2.32	0.34	0.56
Ortho Phosphate (mg/L)	0.03	0.50	0.19	0.13	0.09
Total Phosphate (mg/L)	0.03	0.98	0.30	0.13	0.09
Total Suspended Solids	0.20	53.0	80.0	27.0	3.0

ND = not detected. NR=not reported. Samples collected by Aqua Pennsylvania, Inc. and analyzed by Philadelphia Water Department

### Contact Information

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## Dam Removal on Manatawny Creek Helps Restore Water Quality

### Waterbody Improved

An orphaned dam located on the Manatawny Creek below Pottstown's Memorial Park blocked free passage from the Schuylkill River for a number of migratory fish species and contributed to water quality problems due to stagnant flows within the dam pool resulting in accumulated sediment. Algal blooms were also a pervasive problem in this area as well as dissolved oxygen levels frequently too low to support aquatic life. The dam was removed, stream channel

stabilized and riparian buffers planted. In 2003, the stream was reassessed. Based on the macroinvertebrate population, twenty miles upstream from the mouth and an additional 2.3 miles of an unnamed tributary were delisted from Pennsylvania's Section 303(d) List of Impaired Stream.

### **Problem**

The Manatawny Creek Watershed covers 91.6 square miles (58,000 acres) and includes parts of both Berks and Montgomery Counties, entering the Schuylkill River at Pottstown. In 1997 the Berks County Conservancy in cooperation with the Montgomery County Lands Trust with a grant from the Keystone Recreation, Park and Conservation Fund began a Rivers Conservation Plan for the Manatawny Watershed. While erosion and sedimentation were problems throughout the watershed they were most significant in conjunction with the dam. Algal blooms were also a pervasive problem in this area as well as dissolved oxygen levels frequently too low to support aquatic life. For these reasons, along with the results of a SERA (Stream Enrichment Risk Analysis) survey in 1987, several stream miles of the Manatawny Watershed were placed on the Section 303(d) list as impairments for sediment, nutrients and low dissolved oxygen due to agriculture and the orphaned dam (hydromodification.)

The Pennsylvania Fish and Boat Commission removed the orphaned dam in 2000 and restored the flow of the Manatawny through Pottstown's Memorial Park. After removal of the dam, stream bank erosion had become a severe problem in the park with some sections losing 3 to 5 feet of bank a year.

### **Project Highlights**

In 1997, the Berks County Conservancy in cooperation with the Montgomery County Lands Trust with a grant from the Keystone Recreation, Park and Conservation Fund began a Rivers Conservation Plan for the Manatawny Watershed. Among the problems identified in the plan was an orphaned dam below Pottstown's Memorial Park that slowed the flows and resulted in accumulated sediment.

The Pennsylvania Fish and Boat Commission removed the orphaned dam in 2000 and restored the flow of the Manatawny through Pottstown's Memorial Park. The removal of the dam also created an exposed, free-flowing unstable channel in the 2000 linear feet formerly held in the dam impoundment.

In 2001, the Delaware Riverkeeper was awarded a Section 319 grant for \$90,000 to stabilize and restore the former impoundment and riparian areas. Approximately 2000 linear feet of stream channel was stabilized using Natural Stream Channel Design practices and the use of rock vanes. In addition, approximately 2000 linear feet of riparian buffer were restored along the Manatawny Creek.

The Natural Academy of Science was awarded a \$369,000 Growing Greener grant to assess the potential effectiveness of dam removal as a river restoration method. The Manatawny Creek project has been continually monitored by the Academy of Natural Sciences. Their research already completed has documented many of the physical, biological, and chemical changes in the former impoundment of the removed orphan dam. Most of the changes documented exhibit the

changes from a lentic (lake or pond-like) to lotic (stream or river) system. This was most distinguishable in the fish and macroinvertebrate populations. The project research has produced several reports of value to the science of dam removal. For more information refer to Natural Academy of Science website

<http://www.acnatsci.org/research/pcer/manatawnyprojectinfo.html>

Public education has taken on several roles throughout this project. Public outreach meetings on the topic of dam removal, formal meetings with borough officials and residents concerning riparian vegetation management., several articles in the Pottstown Mercury covering various aspects of project work and two Watershed Weekly shows produced by Greenworks TV.

In 2003, DEP biologists reassessed the Manatawny Creek and based on the macroinvertebrate population, twenty miles upstream from the mouth and an additional 2.3 miles of an unnamed tributary were delisted from Pennsylvania's Section 303(d) List of Impaired Streams. The dam removal and the stream restoration definitely made a difference and were credited for part of the stream miles being delisted.

#### **Project Timeline:**

- August 2000 -** First stage of dam removal.
- November 2000 -** Second stage of dam removal.
- September 2001 -** Phase 1 bioengineering regrade and stabilize.
- November 2002 -** Phase 2 bioengineering and rock vane installation.
- Summer 2003 -** Abandoned pipe footer removed and plans for long-term control of purple loosestrife developed.
- October 2003 -** Stream reassessed and recommended for delisting from 303(d) List.





Staff from the Academy of Natural Sciences monitoring fish populations along Manatawny Creek.

## Results

The dam removal and restoration of Manatawny Creek in Pottstown, PA, has created a successful stream and riparian restoration project in a highly urbanized setting. The present fish and macroinvertebrate populations have resulted in twenty miles of the main stem and 2.3 miles of an unnamed tributary being delisted from the Section 303(d) List of Impaired Streams.

- 1) Dam removed and free flowing stream restored allowing free passage to and from the Schuylkill River for a number of migratory fish species.
- 2) Based on the macroinvertebrate population, twenty miles upstream from the mouth and an additional 2.3 miles of an unnamed tributary were delisted from Pennsylvania's Section 303(d) List of Impaired Stream.
- 3) The Delaware Riverkeeper has developed a web and print based publication on control of invasives: *Purple Loosestrife Control Plan for Manatawny Creek*: Delaware Riverkeeper Network, August 2003.



Phase 2-project area in the summer of 2003.

## Partners & Funding

The Pennsylvania Fish and Boat Commission removed the orphaned dam in 2000 and restored the flow of the Manatawny through Pottstown's Memorial Park. In 2001, the Delaware Riverkeeper was awarded a Section 319 grant for \$90,000 to stabilize and restore the former impoundment and riparian areas. In addition, the Natural Academy of Science - The Patrick Center for Environmental Research was awarded a \$369,000 Growing Greener grant to assess the potential effectiveness of dam removal as a river restoration method. Additional partners were Greater Pottstown Watershed Alliance; Borough of Pottstown (Parks and Recreation); U.S. Fish and Wildlife Service; Pennsylvania Department of Environmental Protection; U.S.

Environmental Protection Agency's Nonpoint Source Program; Montgomery County  
Conservation District; Pennsylvania Fish and Boat Commission; Berks County Conservancy

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## APPENDICES

### Nonpoint Source Liaison Workgroup Partners

#### Local Organizations & Private Sector Partners

Aquatic Resources Restoration, Inc.  
Alliance for the Chesapeake Bay  
Canaan Valley Institute  
Eastern Pa. Coalition for Abandoned Mine Reclamation (EPCAMR)  
F. X. Browne, Inc.  
Hardwood Lumber Manufacturers Association  
Keystone Stream Team  
League of Women Voters of Pennsylvania  
Pa Lakes Management Society (PALMS)  
Pa Association of Conservation Districts  
Pa Organization of Watersheds and Rivers  
Pa Rural Water Association  
Skelly and Loy, Inc.  
Sustainable Forestry Initiative of Pennsylvania  
Western Pa. Coalition for Abandoned Mine Reclamation (WPCAMR)  
Western Pa. Conservancy, Watershed Assistance Center  
The Pennsylvania State University and Cooperative Extension  
Delaware Valley College of Science and Agriculture  
Villanova University

#### Colleges and Universities

#### State NPS Program Lead State Partners

Pa Department of Environmental Protection (DEP)  
DEP Grants Center  
Pa Dept. of Conservation and Natural Resources (DCNR)  
Pa DCNR Citizens Advisory Council  
Pa Department of Agriculture and the PDA Hardwood Council  
Pa Fish and Boat Commission, Pa Game Commission  
State Conservation Commission  
Pa Department of Transportation (PennDOT)  
Pa Infrastructure Investment Authority (PENNVEST)  
Pa Farm Bureau  
Pa Builders Association  
Pa Chamber of Business and Industry  
Pa Department of Community and Economic Development (DCED)  
Governor's Center, Pa DCED  
Pa State Association of Township Supervisors (PSATS)

#### Federal Partners

U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service  
U.S. Department of Energy, Pittsburgh Energy Tech Center  
U.S. Department of Interior, Office of Surface Mining  
U.S. Geological Survey (USGS)  
USDA, NRCS and FSA  
U.S. Forest Service  
National Park Service  
Ohio River Basin Commission  
Interstate Commission on the Potomac River Basin  
Susquehanna River Basin Commission  
Delaware River Basin Commission  
Ohio River Valley Water Sanitation Commission

## Pennsylvania Natural Resources Conservation Service (NRCS) FFY2005 Goal Summary of Progress

This information was drawn from the USDA, NRCS database.

**Table 14. NRCS Conservation Practices**

	Acres Applied To	Number	Tons
Conservation System Plans Written – Cropland	182,997.		
Conservation System Plans Written – Grazing Land	37,557.		
Grazing Land Practices Applied	26,601.		
CNMP Written (Code 100) *		279	
CNMP Applied *		173	
Wetlands Created, Restored, or Enhanced (Codes 657, 658, 659)	834		
Ag Lands treated for which wildlife habitat is the primary or secondary resource concern (CSG)	39,079.		
Ag Lands Managed for the Protection and Enhancement of Habitat for Species with Declining Populations	2,240.		
Reduction in Acreage of Cropland Soils Damaged by Erosion	87,555.		
Soil Erosion Reduced			770,915

\* Comprehensive Nutrient Management Plan (CNMP)